Statement of Teaching

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My research experience spans an array of security, systems, and networking related problems. I will teach and offer courses at both the undergraduate and graduate levels in programming; data structures and algorithms; operating systems; computer and network security; and privacy-enhancing technologies.

Teaching Experience

My graduate teaching experience has prepared me as an effective teacher; I was an instructor in the Communications Systems Laboratory, Web Server Design, Pervasive Computing, Computer Networks, Electric Circuits, Data Structures and Algorithms, and Computers and Programming courses. My teaching duties included delivering lectures and instructing lab sessions, preparing and designing course material, correcting assignments and exams, holding office hours, and guiding students through class projects.

I designed and taught the Mobile Adhoc and Sensor Networks lab at the American University of Beirut. In the lab, I introduced network simulation concepts to students and organized hands-on sessions to train them on how to employ network simulation for evaluating and understanding network protocols. During each session, students had to simulate a network protocol under multiple experimental settings and then report their findings in a written report. Additionally, the lab included a term project; I helped students identify problems in mobile wireless networks and guided them through the design, implementation, and evaluation of their solutions.

Teaching Approach

Undergraduate Teaching: My teaching philosophy hinges upon three principles: fostering independent thinking, keeping students engaged, and providing theoretical underpinnings along with practical aspects of concepts. As a student and a teacher, I found that achieving those goals at the undergraduate level requires a medley of methods. Whiteboard and slides are a useful aid for students to follow proofs, derivations, and protocol interactions, but should not be the primary method of instruction. On the other hand, employing active learning techniques, such as hands-on sessions, online collaboration tools, and group work, transform the classroom into an environment of lively discussions and interactions. For example, instead of merely transmitting security concepts to students, they can discover them in class, on their own. During group discussions, students can identify vulnerabilities in a given design or implementation and propose methods to improve. Students can then conceptualize group discussions to define best practices for more secure implementations and designs. To evaluate students, I will rely more on homework to have students explore the material on their pace, far from the pressures of the exam room.

During my research, I discovered that a majority of the security and privacy issues in our systems come from poor design and implementation choices. For example, a popular location-aware app had its encryption keys hard-coded inside the app's package, exposing user data over the network. A software developer with the security mindset would have secured user data more appropriately. As students will build the systems of future, I believe it is crucial for them to be security- and privacy-aware. I will instill the security mindset for students by going beyond dedicated security courses. I plan to introduce relevant security and privacy concepts in each software or networks course I teach. My objective is to have students consider security and privacy as design dimensions when building systems. For example, I will teach students to avoid buffer overflow vulnerabilities in their first programming course and protect customers' data in their first database systems course.

Graduate Teaching: From my education experience, I found that teaching upper-level and graduate courses requires a research-oriented approach comprising three components. First, I will rely on research paper reading and critique. Instead of studying different systems and protocols as facts, students can unravel the design process and constraints that led to the final system, identify its shortcomings, and then propose improvements to address its limitations. Second, I will train and guide the students to pursue research problems of their choice and get acquainted with the research process. Finally, I will develop students' oral and written presentation skills by teaching students to communicate their work to a larger audience and how to offer and receive constructive comments from their peers. I will utilize peer reviews on the written and oral presentation as the core evaluation criterion. This will transform the classroom to a mini-conference, with students composing a technical conference committee.

Finally, I plan to offer a graduate-level course in Privacy Enhancing Technologies. The course will expose students to research problems in digital privacy protection from systems, theory, usability, policy, and legal perspectives. I want the students to explore how the different aspects of digital privacy interplay. Students will learn to identify and overcome both technical and non-technical challenges facing privacy enhancing technologies in various domains. Their outcome from the course will be a research contribution to digital privacy protection.